

Predating behavior of the Laughing falcon (*Herpetotheres cachinnans*) on the venomous Amazonian pit viper *Bothrops atrox* (the use of roads as a prey source)

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Abstract

Aspects about the feeding behavior of the Laughing falcon (*Herpetotheres cachinnans*) article remain poorly investigated with scarce reports of identified species ingested by this bird. Worse still, information describing how this bird ingests poisonous snakes is not known. Although this falcon eats snakes, there are no reports of feeding on *Bothrops atrox*. In this work, I describe this predation event and analyze how roads seem to be a potential hunting strategy that *H. cachinnans* exploit to prey on snakes.

Keywords

Cofán Bermejo Ecological Reserve, Diet, Equis, Raptor birds, Venomous snakes

Introduction

The Laughing falcon (*Herpetotheres cachinnans*) is a raptor bird with a wide distribution from Mexico to Argentina, inhabiting forests edges and open areas with isolated trees (Thiollay 1994; Castroviejo and Ibañez 2005). Its diet comprises a variety of organisms like arthropods, anurans, lizards, birds, rabbits, rodents, bats, and fishes but they mainly feed on snakes, including large and poisonous ones (DuVal et al. 2006; Costa et al. 2010; Specht et al. 2013).

A review conducted by Costa et al. (2014), analyzed literature references and author's records and found that 73% of prey records for *H. cachinnans* were snakes.

Concerning venomous snakes, there is limited knowledge of identified species preyed on by this falcon, although published articles report predation on *Crotalus durissus*, *Bothriechis schlegelii*, *Bothrops asper*, *Micrurus nigrocinctus*, *M. lemniscatus* (Specht et al. 2013; Laurencio 2005; Sasa et al. 2009; DuVal et al. 2006; Sazima and Abe 1991). Nevertheless, insufficient information has come to light concerning the way they adopt to predate venomous snakes.

Although Sasa et al. (2009) reported *H. cachinnans* eating *Bothrops asper*, there are no records about predation events on *Bothrops atrox*. In this work, I report on *H. cachinnans* eating an Amazonian pit viper *B. atrox*, and describe the process through various time stages.

Methods

For seven days, (8–14 November 2017), in the buffer zone of Cofán Bermejo Ecological Reserve (Sucumbíos province), together with native guides and Ministry of Environment of Ecuador staff, we conducted a wildlife monitoring expedition supported by Paisajes Vida Silvestre Project. We sampled this buffer zone looking for direct and indirect signs of wildlife presence, registering the coordinates of every finding with a Global Positioning System (GPS) Garmin GPSMAP 64S.

Results

On 13 November 2017, we observed a Laughing Falcon holding a c. 1 m long snake (*Bothrops atrox*) in the branch of a tree at 10–15 m high, in Lumbaqui-La bonita roadside, Puerto Libre, Sucumbíos, next to a secondary forest (0.241861, -77.471447).

At 15:48, the falcon was holding the snake by the head, grasping it with one foot; at this stage no signs of damage were observed on the snake body (Fig. 1). From 15:49 to 15:50, the raptor bird occasionally started picking the head of the viper and snake body movement was observed. At 15:51, it was trying to take the viper's head out and began to eat it (Fig. 2). At 15:54, the bird finally decapitated the viper, but 21 seconds



Figure 1. *Herpetotheres cachinnans* holding a *Bothrops atrox*.



Figure 2. Falcon feeding on pit viper's head.



Figure 3. *Bothrops atrox* decapitated by *Herpetotheres cachinnans*.

later, while consuming it, the viper's head fell down from the falcon's beak. From this moment, the falcon was feeding on the body (Fig. 3). Full consumption lasted about 23 minutes from the time the observation began.

Discussion

Apparently *Herpetotheres cachinnans* has a preference for foraging on roads, e.g. it has been listed as road killed in Brazil (Barros et al. 2016) and Paraguay (Smith 2006), Sasa et al. (2009) observed this bird confronting and killing a large female *Bothrops asper* along a roadside and Henderson (2002) reports that *H. cachinnans* may be observed along highways in the Caribbean lowlands of Costa Rica.

The area where this predation event occurred seems to be often used by herpetofauna to cross or lay on the road (five frogs and three snakes were found dead in the same road, the same day). The nearest road killed animal was a frog *Rhinella marina*, found 60 meters away from the predation site, while the farthest road killed animal was an unidentified snake, found 3.6 km away.

Therefore, considering that: 1) *H. cachinnans* mainly feeds on snakes (Costa et al. 2014), 2) snakes are ectotherm animals, that get attracted by the heat of the asphalt, where they lie on sunny days (Romero et al., 2012), and, 3) this predation area seems

to be used by snakes to lie (as mentioned before); it is expected that this falcon is using roads as a prey source.

Studies describing how some species consume and avoid being attacked by venomous animals are scarce. Describing predation processes is important to understand that there are several strategies that birds adopt to avoid being attacked by venomous snakes, which seem to vary for each species. For instance, Secretary birds (*Sagittarius serpentarius*) kick the prey's head to incapacitate or kill before consuming it (Steyn 1983), while it was observed that cobras are predated by *Circaetus pectoralis* grabbing them in their talons and pecking the spine (Steyn 1966).

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